

Message

---

**From:** Mues, Pascal [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=0B2AB2E32A7049D78F063FA77D054524-PMUES]  
**Sent:** 3/25/2020 9:34:44 PM  
**To:** Goodwin, Cathleen@Waterboards [Cathleen.Goodwin@waterboards.ca.gov]; Whitson, Amelia [Whitson.Amelia@epa.gov]  
**CC:** Moore, Heaven@Waterboards [Heaven.Moore@Waterboards.ca.gov]  
**Subject:** RE: Request for assistance evaluating an ammonia modelling proposal from City of Eureka

Cathy, good to be working with you. As I understand you are looking to prepare input by the end of next week, so we probably won't be doing any model runs of our own, but that aside I'm happy to walk through the technical issues with you and help refine what you should ask the discharger and/or their consultant to elaborate on. I've skimmed the consultant's report and their model outputs, and I don't think we need to budget more time for review there, unless there are other elements of the permit package I haven't seen yet that you think need to be taken into consideration.

I am generally available in the afternoons until at least 5 PM, potentially 6. We can try to set up a web-chat via Skype or, if that's infeasible, feel free to call me at my work number below. If you do decide to expand this discussion to other members of your team, please try to give me an hour's advance notice before we hold the bigger call so that we can make sure of the logistics.

Best of luck and health to everyone who is quite literally working through the current situation,  
-Pascal

**Pascal Mues**, Environmental Engineer  
NPDES Permits office, U.S. EPA Region 9, WTR-2-3  
75 Hawthorne Street, San Francisco, CA 94105  
Phone: (415)-972-3768 | [mues.pascal@epa.gov](mailto:mues.pascal@epa.gov)

---

**From:** Goodwin, Cathleen@Waterboards <Cathleen.Goodwin@waterboards.ca.gov>  
**Sent:** Wednesday, March 25, 2020 2:29 PM  
**To:** Whitson, Amelia <Whitson.Amelia@epa.gov>  
**Cc:** Moore, Heaven@Waterboards <Heaven.Moore@Waterboards.ca.gov>; Mues, Pascal <Mues.Pascal@epa.gov>  
**Subject:** RE: Request for assistance evaluating an ammonia modelling proposal from City of Eureka

Amelia and Pascal:

Thank you so much. Yes, I would like to set up a time to discuss this further with Pascal. I'd like to see who else on my Regional Board team would like to participate in the conversation. Pascal, what is your availability for a call? Do you want to take more time to review the City's technical memorandum before we do so? I can let you know our availability soon (after I check in with a couple of Regional Board staff who might participate on the call).

Take Care,  
Cathy

---

**From:** Whitson, Amelia <[Whitson.Amelia@epa.gov](mailto:Whitson.Amelia@epa.gov)>  
**Sent:** Wednesday, March 25, 2020 2:18 PM  
**To:** Goodwin, Cathleen@Waterboards <[Cathleen.Goodwin@waterboards.ca.gov](mailto:Cathleen.Goodwin@waterboards.ca.gov)>  
**Cc:** Moore, Heaven@Waterboards <[Heaven.Moore@Waterboards.ca.gov](mailto:Heaven.Moore@Waterboards.ca.gov)>; Pascal Mues <[Mues.Pascal@epa.gov](mailto:Mues.Pascal@epa.gov)>  
**Subject:** RE: Request for assistance evaluating an ammonia modelling proposal from City of Eureka

EXTERNAL:

Hi Cathy,

Was so nice to talk with you earlier today. So glad to hear you and your family are safe and healthy! Hope the working-from-home continues to go smoothly.

Anyway, Pascal very kindly volunteered his time to help with your request. He's an incredible resource on this topic, and he's already very impressed with your review of the documents. He actually already had a chance to put together some initial responses on the documents you'd attached:

Following the same numbering scheme as Cathleen's comments in Attachment C:

- 1.a: We must evaluate how appropriate the Visual Plumes / UM3 model is for this discharge in the context of what modes of dilution the discharger is claiming to prove. In this case, they only seem to be seeking buoyant-plume mixing, aka "initial dilution", which UM3 can provide good results for if carefully parametrized and staying aware of the model's limitations.  
UM3 isn't sophisticated enough to take into account complex bottom shape or nearby shorelines of the kind we might expect in Humboldt Bay, much less tidal currents that change over time. The consultant's report does not demonstrate that they carefully considered and protected against those limitations of the model chosen, when they really should show their work.  
Because the discharger is only claiming initial, buoyant-plume dilution the results from UM3 / Visual Plumes are not *inherently* invalid. But, when EPA recently faced a similar discharge into a *less*-constrained bay (Pago Pago Harbor in American Samoa), we had to get the modeling re-done in CORMIX and found significant potential for boundary interactions that could reduce effective dilution.
- 1.a.i: A "sensitivity analysis" (i.e. submitting multiple model runs with variations in input parameters, including more than 2 flow rates) would be a normal best practice for modeling a discharge for the first time, and I would wholeheartedly support Cathleen's request here, even if the discharger complains about the additional time and cost.
- 1.b: The consultant's assumption of "zero background level" for Ammonia is probably the single biggest flaw in the analysis. Especially with a narrow-mouthed tidally-influenced system like Humboldt Bay, you would expect plume re-entrainment unless proven otherwise, and that can dramatically reduce effective dilution. Are there any "reference station" data, from this permit or other dischargers, that could be used to get a background value? Also worth double-checking that consistent assumptions were used for the chemical transformation model.
- Skipping to 4.b: The "entrained ambient volume" only comes up in a general description in the report, so there is not a numeric value to report, but in practice yes this is based on how the algorithms in the model work.
- 4.c: UM3 does not produce 3-dimensional graphs of the effluent plume just because the base code of the model dates back to before computers were reasonably capable of rendering a 3-d graph like that. However, for information on "how far from the outfall the mini plumes blend together", see Attachment B to the consultant's report and look for the lines of the model where it says "merging".

Pascal also said he'd be happy to set up a phone call to discuss further with you. I'll leave it to the two of you to set up a time to talk, and no need to involve me (unless you'd like me to help facilitate in any way).

All the best,

Amelia Whitson  
NPDES Permits Office (WTR-2-3)

US EPA, Region 9  
75 Hawthorne Street  
San Francisco, CA 94105  
(415) 972-3216

---

**From:** Goodwin, Cathleen@Waterboards <Cathleen.Goodwin@waterboards.ca.gov>  
**Sent:** Monday, March 23, 2020 3:56 PM  
**To:** Whitson, Amelia <Whitson.Amelia@epa.gov>  
**Cc:** Moore, Heaven@Waterboards <Heaven.Moore@Waterboards.ca.gov>  
**Subject:** Request for assistance evaluating an ammonia modelling proposal from City of Eureka

Hi Amelia:

I hope you are well during the current COVID-19 emergency. Are USEPA staff working from home at this time?

I believe I spoke with you about the City of Eureka's proposal to use modelling to try to demonstrate that ammonia does not have the potential to exceed effluent limitations for ammonia. I just can't remember how much we discussed this. The City submitted the proposal in December 2019. I am just getting back to working on Eureka after working on getting the Santa Rosa permit out for public comment. I need to provide comments to the City on their proposal and whether such an approach is even an option.

Regional Board staff wish to request USEPA assistance in reviewing the City's proposal. Heaven Moore talked with someone from USEPA when she attended the NPDES Permit Writers' Training earlier this month. That person recommended that we contact Pascal Mues indicating that he has modelling background. Is it appropriate for me to contact Pascal directly to make this request? If not, how do you recommend that I request USEPA assistance for review of the City's technical memorandum? We are interested in providing the City with feedback soon. We want to be able to tell them whether this approach is an option for demonstrating that ammonia is not (or is) exceeding effluent limitations and, if so, identify the minimum requirements and appropriate assumptions to include in the evaluation to ensure a robust analysis. We also need guidance on appropriate modelling software.

I have attached the City's technical memorandum as well as a list of comments that I developed when I reviewed the technical memorandum.

I look forward to hearing from you.

Cathleen Goodwin  
Water Resources Control Engineer  
North Coast Regional Water Quality Control Board  
5550 Skylane Boulevard, Suite A  
Santa Rosa, CA 95403

Desk Phone No.: (707) 576-2687  
Fax Phone No.: (707) 523-0135  
Email: [Cathleen.Goodwin@waterboards.ca.gov](mailto:Cathleen.Goodwin@waterboards.ca.gov)

*The governor of California has issued a statewide shelter in place order due to the COVID-19 emergency. The Water Boards are continuing day-to-day work protecting public health, safety, and the environment. However, most staff are working remotely and we continue to check email and voicemail regularly. Thank you and stay healthy and safe.*